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09/344,688	06/25/1999	ARTHUR ALLEN	BW-02	9340

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EXAMINER
LEE, WENDY

ART UNIT	PAPER NUMBER
2155	

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Please find below and/or attached an Office communication concerning this application or proceeding.

NH.

Office Action Summary	Application No. 09/344,688	Applicant(s) ALLEN, ARTHUR	
	Examiner Wendy Lee	Art Unit 2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The following guidelines illustrate the preferred layout and content for patent applications. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

The following order or arrangement is preferred in framing the specification and, except for the reference to the drawings, each of the lettered items should appear in upper case, without underling or bold type, as section headings. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) Title of the Invention.
(b) Cross-Reference to Related Applications.
(c) Statement Regarding Federally Sponsored Research or Development.
(d) Reference to a "Sequence Listing," a table, or a computer program listing appendix submitted on compact disc (see 37 CFR 1.52(e)(5)).
(e) Background of the Invention.
    1. Field of the Invention.
    2. Description of the Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) Brief Summary of the Invention.
(g) Brief Description of the Several Views of the Drawing(s).
(h) Detailed Description of the Invention.
(i) Claim or Claims (commencing on a separate sheet).
(j) Abstract of the Disclosure (commencing on a separate sheet).
(k) Drawings.
(l) Sequence Listing, if on paper (see 37 CFR 1.821-1.825).

2. The spacing of the lines of the specification is such as to make reading and entry of amendments difficult. New application papers with lines double spaced on good quality paper are required.

Claim Objections

3. The claims are objected to because the lines are crowded too closely together, making reading and entry of amendments difficult. Substitute claims with lines one and one-half or double spaced on good quality paper are required. See 37 CFR 1.52(b).
4. Claim 1 is objected to because of the following informalities: Steps 4 and 5 are misnumbered. Appropriate correction is required.
5. Claim 5 and 12 are objected to because of the following informalities: It is requested that the applicant check the spelling of words. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 recites the limitation "said inequalities" in line 15. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenblum et al. U.S. Patent No. 6,240,103 in view of Mitra et al. U.S. Patent No. 6,331,986.

2. Referring to Claim 1, Schoenblum et al. discloses a method for optimal multimedia content delivery over networks from server to client comprising: the steps of delineating a state variable that represents the data rate to each client (Col. 9 Lines 16-25); delineating a set of requirements which represent the time-varying constraints on the data rate of said multimedia content; given by: the total data rate for all clients does not exceed the maximum throughput of the server network (Figure 5 Item 160); the data rate from server to client does not exceed the maximum data rate for the client (Claim 3 lines56-60); the data rate to the client will never overflow the client buffer (Col. 8 lines 9-15 and Claim 2); the server will never underflow (Col. 8 lines 9-15 and Claim 2); and the data rate from the server will never be less than the client's minimum data rate, which is a non-increasing function of time obtained by dividing the content not yet delivered by the remaining play time (Abstract). It is noted that the method disclosed by Schoenblum may be used for transmitting multimedia content such as digital television (Col. 1 lines 39-40).

Schoenblum et al. also does not disclose the step of delineating a cost function. Mitra et al. discloses the step of delineating a cost function which represents the value of a proposed solution and performing periodic computations to solve said inequalities to obtain the state value that maximizes said cost function (Figure 9 Items 131 and 132 and Figure 10-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Schoenblum et al. to include the cost

function disclosed by Mitra et al. because it would allow the Schoenblum et al. system to delineate a cost function.

3. Referring to Claim 2, Schoenblum et al. discloses a method as in claim 1 further comprising: the current maximum client data rate is given by the minimum of: the stored initial maximum client data rate (Col. 9 Lines 16-25); the data rate required to fill the remaining client buffer during the current of said periodic computations (Abstract); the data rate required to complete the delivery of said multimedia content (Abstract); the client data rate never exceeds said current maximum client data rate (Claim 3 lines 56-60 and Claim 6) whereby said current maximum client data rate is periodically recomputed to maintain an optimal solution over a give period of time (Abstract).

4. Referring to Claim 3, Schoenblum et al. discloses a method as in claim 2. However, Schoenblum does not disclose a method further comprising said cost function represents maximal throughput and is given by the sum of said client data rates for all active clients. Mitra et al. discloses a method for optimal routing and bandwidth allocation comprising a cost function for solving the optimum routing problem (Figure 10 and Figure 9 Item 131). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Schoenblum et al. to include a cost function as disclosed by Mitra et al. because the cost function will calculate the maximal throughput thereby the maximizing the resources and minimizing the cost of operation.

5. Referring to Claim 4, Schoenblum et al. discloses a method as in claim 2. However, Schoenblum does not disclose a method further comprising said cost function represents maximal charge and is given by the sum for all active clients of said client data rates times the client' s cost of service. Mitra et al. discloses a method for optimal routing and bandwidth allocation comprising a cost function for computing the implied costs (Figure 11 and Figure 9 Item 132). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Schoenblum et al. to include a cost function as disclosed by Mitra et al. because the cost function will calculate the maximal charge thereby maximizing the resources and minimizing the cost of operation.

6. Referring to Claim 5, Schoenblum et al. discloses a method as in claim 3 for bandwidth allocation for delivery of multimedia data from server to one or more clients over a network, comprising the steps of: determining the maximum flow rate and minimum flow rate for each client (Abstract); determining the flow rate range for each client as given by the difference between said maximum flow rate, and said minimum flow rate (Figure 5 Item 166 and Col. 11 lines 45-55); initializing current flow rate for each client as said minimum flow rate and summing said flow rate into total server flow rate (Abstract); and allocating remaining server bandwidth to remaining clients until they each saturate or no bandwidth remains (Abstract and Col. 11 lines 33-40 and Col. 11 lines 43-46).

7. Referring to Claim 6, Schoenblum et al. discloses a method as in claim 5 wherein said step of allocating remaining server bandwidth to remaining clients is done fairly by a procedure that comprises the steps of: sorting the list of clients according to said flow rate range (Claim 12); determining equally-allocated remaining server bandwidth if allocated evenly to all remaining unprocessed clients (Col. 11 lines 33-40); determining the range of remaining client bandwidth as given by the difference between said maximum flow rate and said minimum flow rate (Figure 5 Item 166 and Col. 11 lines 45-55); and determining saturation by comparing said equally allocated remaining server bandwidth and said range of remaining client bandwidth (Col. 11 lines 43-46) and allocating the lesser of these two amounts to each remaining client flow rate (Figure 5 Items 166 and 168).

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenblum et al. as applied to claim 4 above, and further in view of Mitra et al. and Odlyzko U.S. Patent No. 6,295,294.

9. Referring to Claim 7, Schoenblum et al. discloses a method as in claim 4 for bandwidth allocation for delivery of multimedia data from server to one or more clients over a network, comprising the steps of determining the maximum flow rate and minimum flow rate for each client (Abstract); determining the flow rate range for each client as given by the difference between said maximum flow rate and said minimum flow rate (Figure 5 Item 166 and col. 11 lines 45-55); and initializing current flow rate for each client as said minimum flow rate and summing said flow rate into total, server flow rate (Abstract). Schoenblum et al. does not

teach the concept of sorting the list of clients according to said flow rate range however he teaches the concept of having lower and higher priority channels to handle the problem of not having enough bandwidth (Claim 12 and Figure 7 Item 176b).

Schoenblum et al. also does not teach the step of allocating remaining server bandwidth to remaining clients (Col. 11 lines 33-40) such that lower paying clients receive bandwidth only if higher paying ones is saturated. Odlyzko teaches a technique where each user will select a channel that provides the subjectively optimal balance of cost and perceived quality of service with the lowest cost channels presumably carrying the most traffic and the highest cost channel accordingly carrying the least traffic (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Schoenblum et al. to include the concept of prioritizing the clients where higher paying clients gets allocated first to avoid dropping the higher priority (higher cost) channels during heavy congestion. As taught by Odlyzko, dividing the network into logical channels having graded costs will regulate traffic and limit congestion because users who perceive that the quality of service on a lower cost channel has degraded to an unacceptable level will if they have the available resources, switch to a high cost channel which because of its high cost, will have less traffic and hence less congestion (Col. 3 lines 9-15).

10. Referring to Claim 8, Schoenblum et al. discloses a method as in claim 7 wherein said step of allocating remaining server bandwidth to remaining unprocessed clients comprises the steps of: determining equally-allocated remaining server bandwidth if allocated evenly to all

remaining unprocessed clients and (Abstract and Col. 11 lines 43-46); determining the range of remaining client bandwidth as given by the difference between said maximum flow rate and said minimum flow rate (Figure 5 Item 166 and Col. 11 lines 45-55) ; and allocating the lesser of these two amounts to each remaining client flow rate (Abstract). Schoenblum does not disclose the step of determining saturation by comparing said equally allocated remaining server bandwidth and said range of remaining client bandwidth. Schoenblum discloses a method comprising the step of comparing the bandwidth output requirements with the receiver bandwidth capability and reallocating bits so that the bandwidth output requirement for each time slice is less than the receiver bandwidth capability (Claim 15 Col. 16 lines 33-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compare the equally allocated remaining server bandwidth to the range of remaining client bandwidth to maximize the number of clients and maintain high quality of service.

11. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. U.S. Patent No. 5,982,748 in view of Schoenblum et al.

12. Referring to Claim 9, Yin et al. discloses a method for controlling admission of connection requests and allocation of bandwidth in a network environment to ensure performance at the connection level and guarantee that particular Quality of Service (QoS) requirements are maintained for each data flow. Further Yin et al. discloses a step of determining the server swing capacity given by the difference between the total server

bandwidth and the resources already assigned to existing connections using the requested class of service (Col. 5 lines 61-66 and Figure 3 Item 60). Yin et al. does not teach the use of the sum of the minimum flow rate for each client in the calculation of the server swing capacity. However, Schoenblum et al. discloses a step of determining the server swing capacity given by the difference between the total server bandwidth and the sum of the minimum flow rate for each client (Abstract and Col. 11 lines 33-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the server swing capacity of Yin et al. to include the sum of the minimum flow rate for each client as used by Schoenblum et al. because using the sum of the minimum flow rate will maximize the server swing capacity and allow for more flexibility.

Yin et al. also teaches that the calculations and procedures used to determine whether to accept or reject a connection request may vary depending on the particular service class associated with the connection request (Col. 6 lines 11-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use compare the average data pay rate of each prospective client with the remaining bandwidth available to the server to ensure that the client will not allow server bandwidth saturation.

13. Referring to Claim 10, Yin et al. discloses a method as in claim 9 wherein said remaining bandwidth available to the server is given by the difference between the total resource available and the resources already assigned to existing connections (Col. 5 lines 61-66).

Yin et al. does not teach the concept of the server swing capacity. However, Schoenblum et al. discloses that the remaining bandwidth available to the server is given by the difference between the total server bandwidth and the sum of the minimum flow rate for each client (Abstract and Col. 11 lines 33-40 Adjusted Packets Left is read as Server Swing Capacity). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Yin et al. to include the server swing capacity element disclosed by Schoenblum et al. to maximize the remaining bandwidth available to the server and allow for more flexibility.

14. Referring to Claim 11, Yin et al. discloses a method as in claim 10 wherein said remaining bandwidth available to the server is given by said server swing capacity less a server flow safety margin (server flow safety margin read as Variable F_b or buffer allocation parameter), thereby allowing server capacity to be subsequently lowered by up to the margin without requiring load shedding, and without affecting client sessions in process (Col. 10 lines 5-9 and Claim 4).

15. Referring to Claim 12, Yin et al. discloses a method as in claim 9 and a step that determines that if adequate resources are available for the connection request, then the connection request is accepted (Col. 6 lines 27-30 and Figure 3). Further Yin et al. teaches that the calculations and procedures used to determine whether to accept or reject a connection request may vary depending on the particular service class associated with the connection request where different service classes may utilize different traffic parameters (Col. 6 lines

10-15). Therefore, Yin et al. disclosed a method wherein said step of allocating server bandwidth for each prospective client which will fit without server bandwidth saturation is further comprised of allocating server bandwidth to each prospective client sequentially until a prospective client is located in which said average data play rate (Col. 1 lines 58-60 Average data play rate read as Sustainable Cell Rate (SCR)) exceeds said sever swing capacity.

16. Referring to Claim 13, Yin et al. discloses a method as in claim 9 wherein said step of allocating server bandwidth for each client which will fit without server bandwidth saturation is further comprised of allocating server bandwidth to each prospective client sequentially for each client which can be activated without server bandwidth saturation (Col. 6 lines 27-30 and Figure 3).

17. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenblum et al.

18. Referring to Claim 14, Schoenblum et al. discloses a method for bandwidth allocation for delivery of multimedia data from server to one or more clients over a network, comprising the steps of: determining the maximum flow rate and minimum flow rate for each client at the present time (Abstract); determining the flow rate range for each client as given by the difference between said maximum flow rate and said minimum flow rate (Figure 5 Item 166 and Col. 11 lines 45-55); sorting the list of clients according to said flow rate range (Col. 11 lines 45-55); initializing current flow rate for each client as said minimum flow rate

(Abstract) and summing said flow rate into total server flow rate (Col. 11 lines 33-40); and allocating remaining server bandwidth to remaining clients (Abstract). Schoenblum et al. does not disclose the step of storing a sequence of data representing scheduled bandwidth changes for the server. However, Schoenblum discloses a method of determining an output rate to a receiver comprising the step of receiving and storing a plurality of time slices of the bit stream in a memory buffer (Claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Schoenblum et al. to include the step of storing a sequence of data representing scheduled bandwidth changes for the server in order to efficiently keep track of bandwidth changes for the server.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wendy Lee whose telephone number is 703-308-9119. The examiner can normally be reached on Mon-Fri (8:30am-5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7201 for regular communications and 703-305-7201 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

WL
January 28, 2002

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
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